

CLAIMS

What is Claimed is:

1. A method for fabricating a semiconductor device, said method comprising the steps of:

5 (a) forming bonding pads above a wafer on which semiconductor elements and an interconnect layer are formed;

(b) forming a passivation film having apertures including regions of the passivation film located above parts of the bonding pads after the step (a);

10 (c) forming a buffer coat film for covering part of the passivation film after the step (b);

(d) forming, in the buffer coat film, apertures including regions of the buffer coat film located above a periphery region having a certain distance from the periphery of the wafer, above scribe line regions and above the parts of the bonding pads, respectively;

15 (e) bonding a surface protection tape to the wafer using an adhesive material after the step (d); and

(f) polishing the rear surface of the wafer after the step (e).

2. The method for fabricating a semiconductor device of Claim 1, wherein

in the step (c), the buffer coat film is formed using a positive-type photosensitive material, and

20 the step (d) includes a process for exposing part of the buffer coat film located on the periphery region of the wafer.

3. The method for fabricating a semiconductor device of Claim 1, wherein

in the step (c), the buffer coat film is formed using a positive-type photosensitive material, and

25 the step (d) includes a process for exposing part of the buffer coat film located on the wholes of chip regions at least partly overlapped with the periphery region of the wafer.

4. The method for fabricating a semiconductor device of Claim 1, wherein

in the step (c), the buffer coat film is formed using an organic resin, and
the step (d) includes a process for selectively removing part of the buffer coat film
located on the periphery region of the wafer by a solvent.

5. The method for fabricating a semiconductor device of Claim 1, wherein

5 in the step (c), the buffer coat film is formed using an organic resin, and
the step (d) includes a process for blowing gas on part of the buffer coat film located
on the periphery region of the wafer before the curing of the buffer coat film.

6. A method for fabricating a semiconductor device, said method comprising the steps
of:

10 (a) forming bonding pads above a wafer on which semiconductor elements and an
interconnect layer are formed;

(b) forming a passivation film having apertures including regions of the passivation
film located above parts of the bonding pads after the step (a);

(c) forming a buffer coat film for covering part of the passivation film after the step
15 (b);

(d) forming, in the buffer coat film, apertures including regions of the buffer coat
film located above scribe line regions and above the parts of the bonding pads, respectively,
and reducing the thickness of part of the buffer coat film located on a periphery region of
the wafer having a certain distance from the periphery of the wafer;

20 (e) bonding a surface protection tape to the wafer using an adhesive material after
the step (d); and

(f) polishing the rear surface of the wafer after the step (e).

7. The method for fabricating a semiconductor device of Claim 6, wherein

25 in the step (d), the thickness of part of the buffer coat film located on the periphery
region is reduced to 3 μ m or less.

8. A method for fabricating a semiconductor device, said method comprising the steps
of:

(a) forming bonding pads above a wafer on which semiconductor elements and an interconnect layer are formed;

(b) forming a passivation film having apertures including regions of the passivation film located above parts of the bonding pads after the step (a);

5 (c) forming a buffer coat film for covering part of the passivation film after the step (b);

(d) forming, in the buffer coat film, apertures including regions of the buffer coat film located above scribe line regions and above the parts of the bonding pads, respectively;

10 (e) bonding a surface protection tape to the wafer using an adhesive paste having a thickness between 20 μ m and 50 μ m both inclusive after the step (d); and

(f) polishing the rear surface of the wafer after the step (e).

9. A method for fabricating a semiconductor device, said method comprising the steps of:

15 (a) forming bonding pads above a wafer on which semiconductor elements and an interconnect layer are formed;

(b) forming a passivation film having apertures including regions of the passivation film located above parts of the bonding pads after the step (a);

20 (c) forming a buffer coat film for covering part of the passivation film after the step (b);

(d) forming, in the buffer coat film, apertures including regions of the buffer coat film located above scribe line regions and above the parts of the bonding pads, respectively;

25 (e) bonding a surface protection tape to the wafer using an adhesive paste after the step (d); and

(f) polishing the rear surface of the wafer using polishing slurry having a viscosity within the range of 3mm²/sec to 10mm²/sec both inclusive after the step (e).

10. The method for fabricating a semiconductor device of Claim 9, wherein the polishing slurry includes polyethylene glycol.

11. A method for fabricating a semiconductor device, said method comprising the steps of:

5 (a) forming bonding pads above a wafer on which semiconductor elements and an interconnect layer are formed;

(b) forming a passivation film having apertures including regions of the passivation film located above parts of the bonding pads after the step (a);

(c) forming a buffer coat film covering part of the passivation film after the step (b);

10 (d) forming, in the buffer coat film, apertures including regions of the buffer coat film located above parts of scribe line regions and above parts of the bonding pads with connection parts connecting between chip regions left among the apertures;

(e) bonding a surface protection tape to the wafer using an adhesive material after the step (d); and

15 (f) polishing the rear surface of the wafer using polishing slurry after the step (e).

12. A semiconductor device comprising:

a semiconductor substrate on which semiconductor elements and an interconnect layer are formed;

bonding pads formed above the semiconductor substrate;

20 a passivation film formed above the semiconductor substrate and having apertures at which parts of the bonding pads are exposed; and

a buffer coat film that covers part of the passivation film and has apertures obtained by removing regions of the buffer coat film located above parts of scribe line regions and above parts of the bonding pads with connection parts connecting between chip regions left
25 among the apertures.